Assets and Liabilities

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Funding Equation

- (L – A) ÷ S

  L = Liabilities (present value)

  A = Assets (smoothed)

  S = Salary (present value of projected salary)
- Produces a contribution that is collected as a percentage of salary
- All else being equal, contributions are minimized when returns are maximized

Interdependent Policies?

- Which is the input:
  - the investment policy or
  - the assumed rate of investment return?
- Ideally, the investment policy would be the input after coordination with the benefits and funding policies
- Practically, the investment policy is the output

Assumed Rate of Return

- Current long-term assumption is 8% (4.5% real rate of return) – RCW 41.45.035
- Increased from 7.5% in 2001
- 7.75% is recommended today
- This assumption change would increase 05-07 general fund-state contributions by about $92 million ($242 m in total employer contributions)

WSIB Statutory Mandate

- Maximize returns at a prudent level of risk for retirement funds
- What does this mean in an environment when the current asset allocation may not support the 8% assumption?
- Short answer: results in a risk transfer

Risk Transfer

- No change to investment policy
  - Future generations (taxpayers and plan 2 employees) may face increasing contributions from deferred losses relative to the 8% assumption
- Change investment policy to match 8% expected return
  - Future generations may face more volatile contributions or short-term deficits

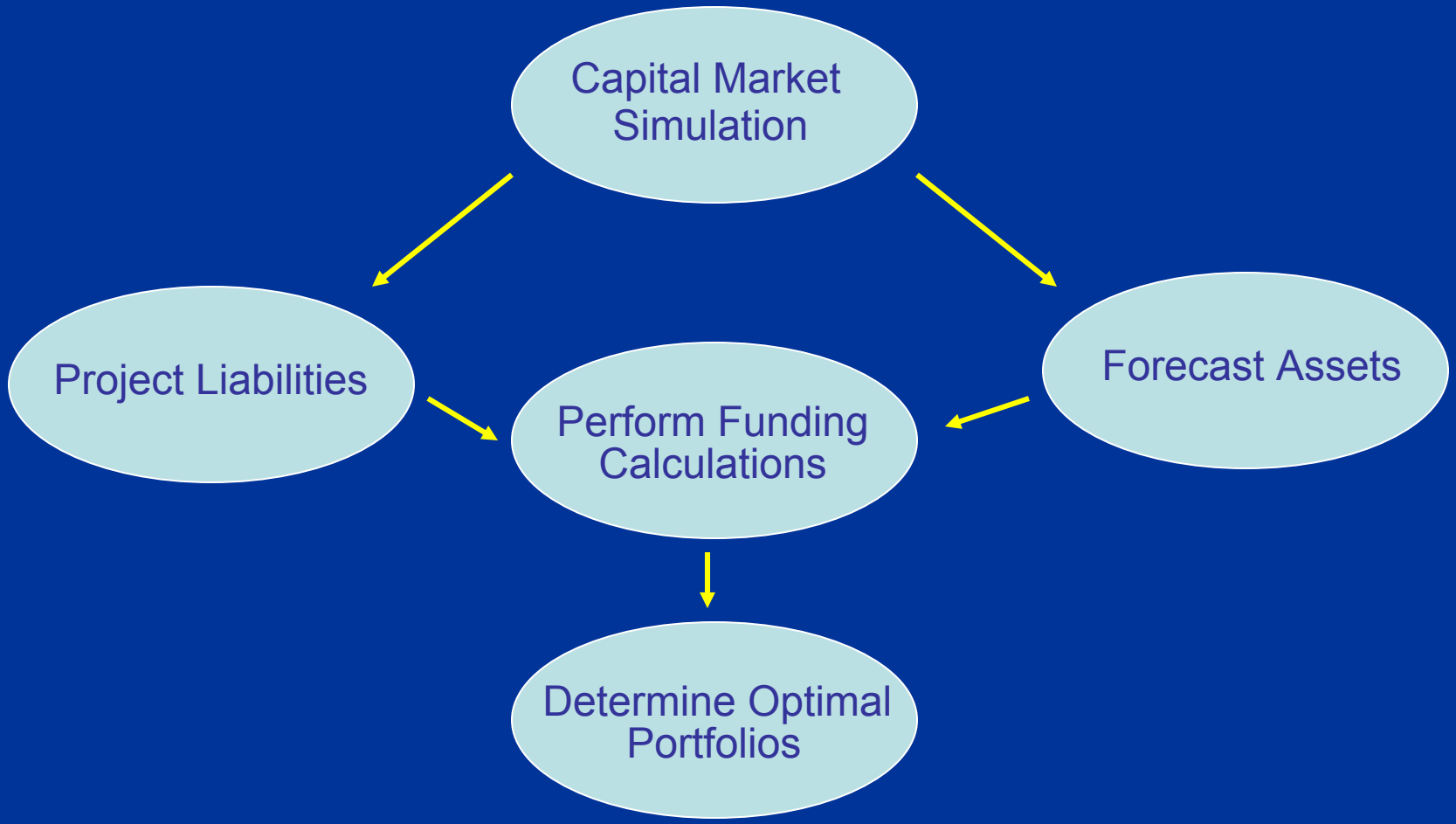
Measurements of Non-Investment Risk

- Variability in funded ratio or surplus/deficit
- Probability of surplus/deficit
- Volatility of contributions
- Probability of significant increase in contributions
- All standard components of an asset liability study

Asset Liability Study

- A “what if” tool
- Provides insights, not perfect solutions
- Objective is to translate risk (investment and non-investment risk) and the impact of strategic decisions into probable dollar consequences for the plan

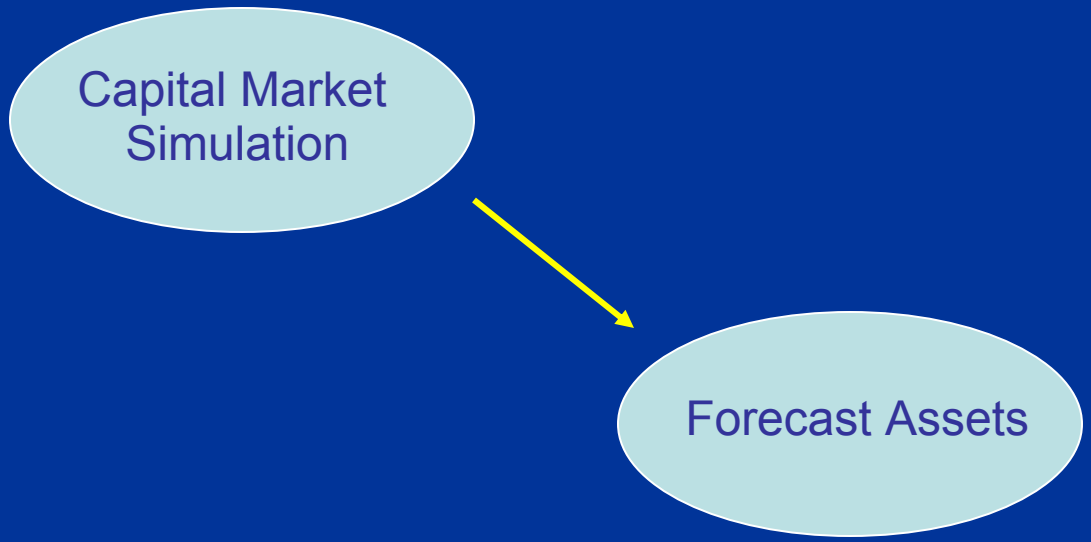
Steps in an A/L Study



Capital Market Simulation

- Generate a large number of stochastic economic scenarios
  - Expected return, standard deviation and correlation coefficients for asset classes
  - Inflation (wage and post-retirement COLAs)
- Used to project liabilities
- Used to produce an efficient frontier before considering liabilities

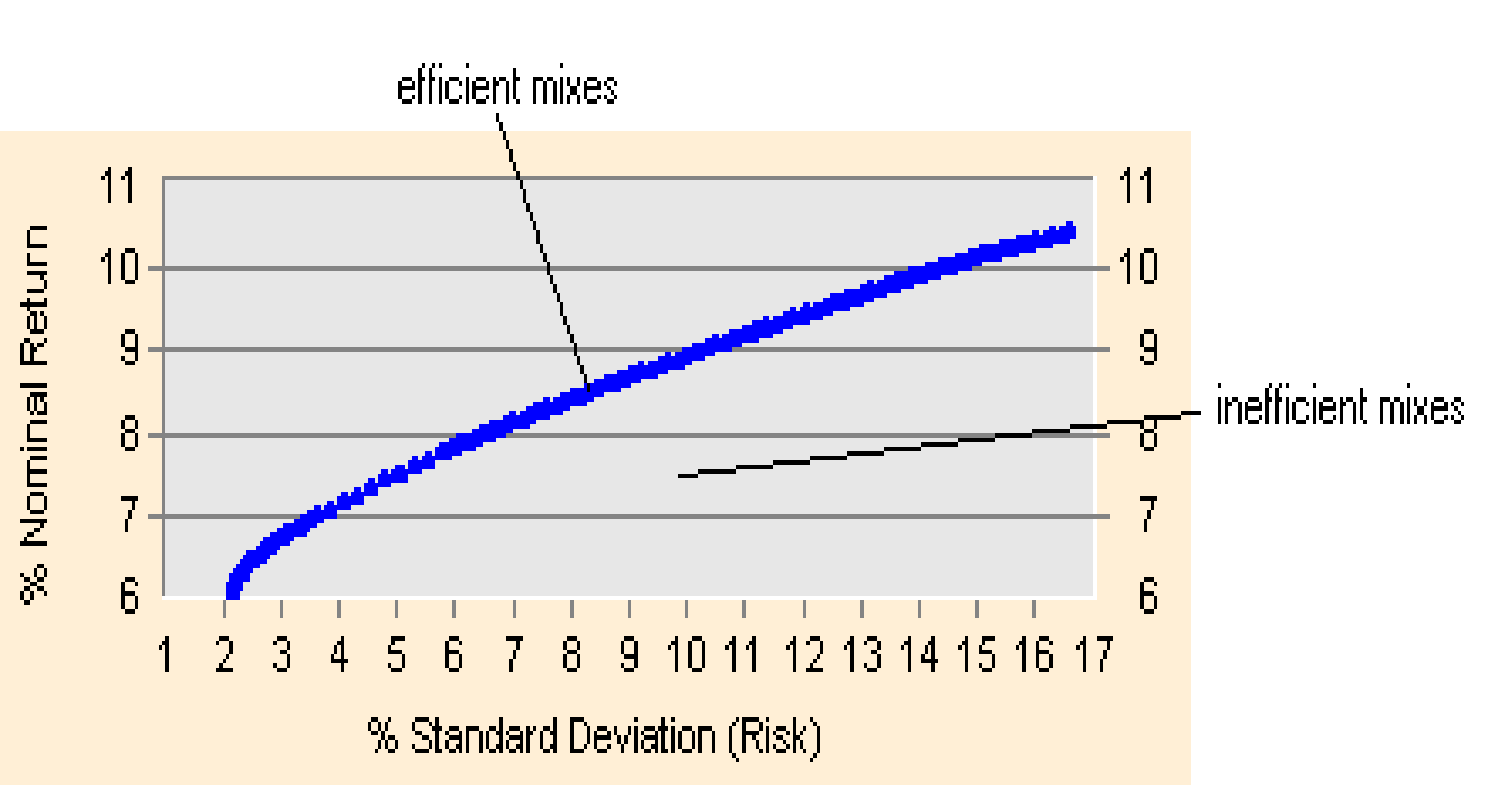
Steps in an A/L Study



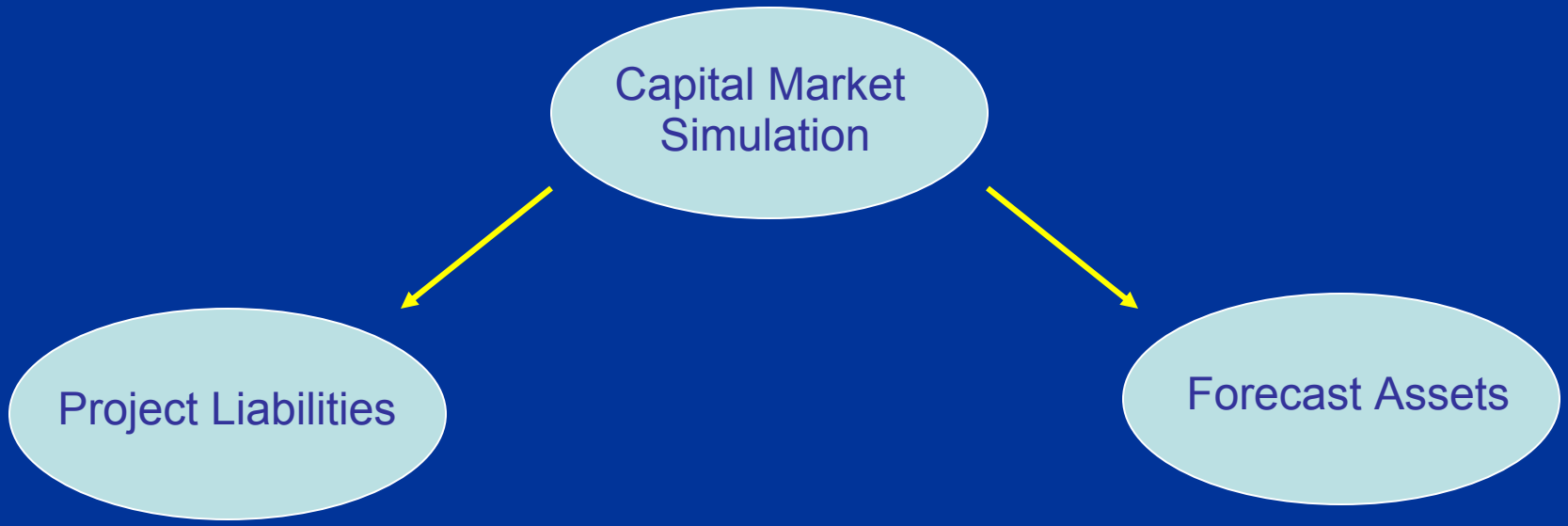
Forecast Assets

- The “efficient frontier” shows all possible combinations of assets which would provide:
  - the highest expected return for various levels of investment risk; or
  - the lowest level of risk to achieve different levels of investment return
  - Does not consider risk of mismatching assets with liabilities (non-investment risk)

Efficient Frontier



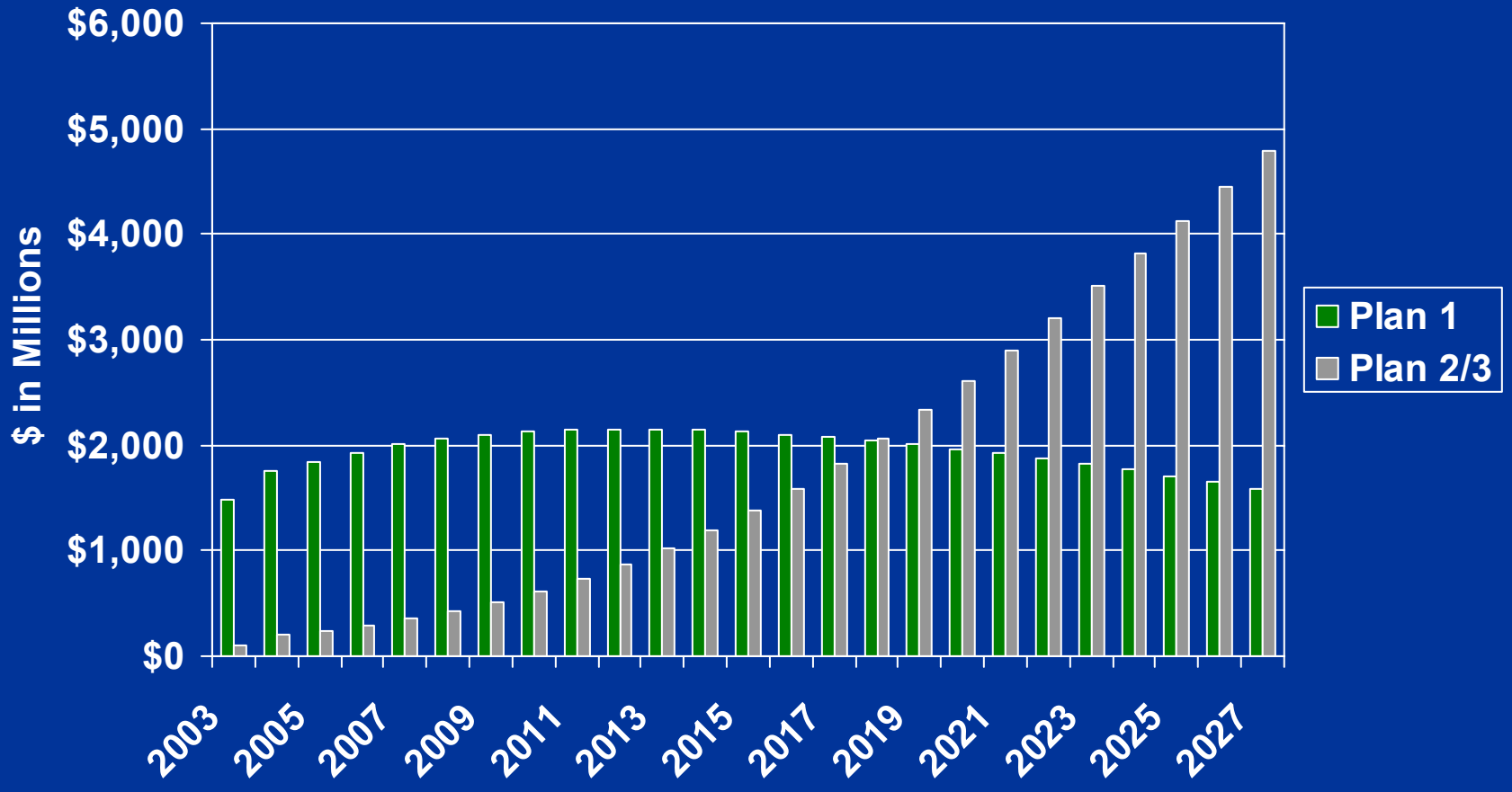
Steps in an A/L Study



Project Liabilities

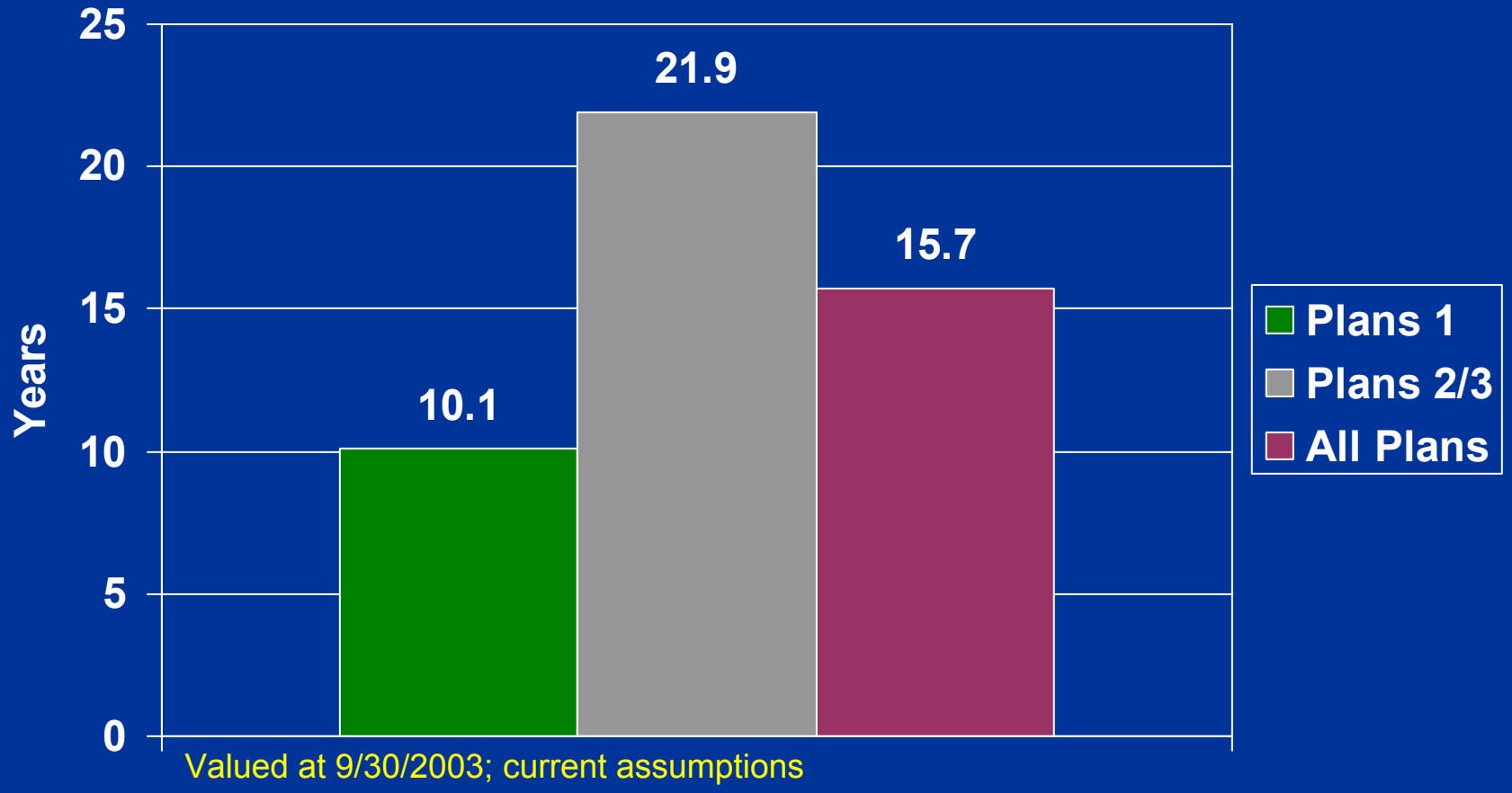
- Project plan demographics and benefits under each simulated economic scenario

Projected Benefit Payments

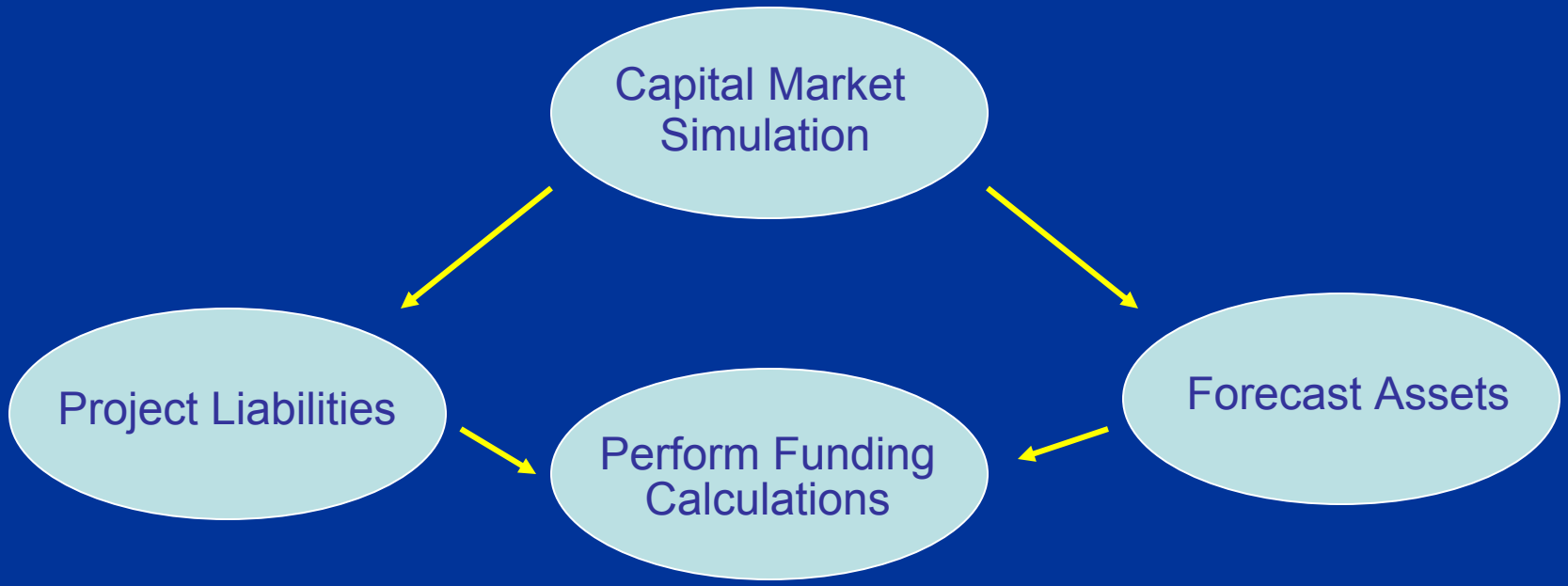


Based on a projection of the 9/30/2003 valuation results

Duration of Liabilities



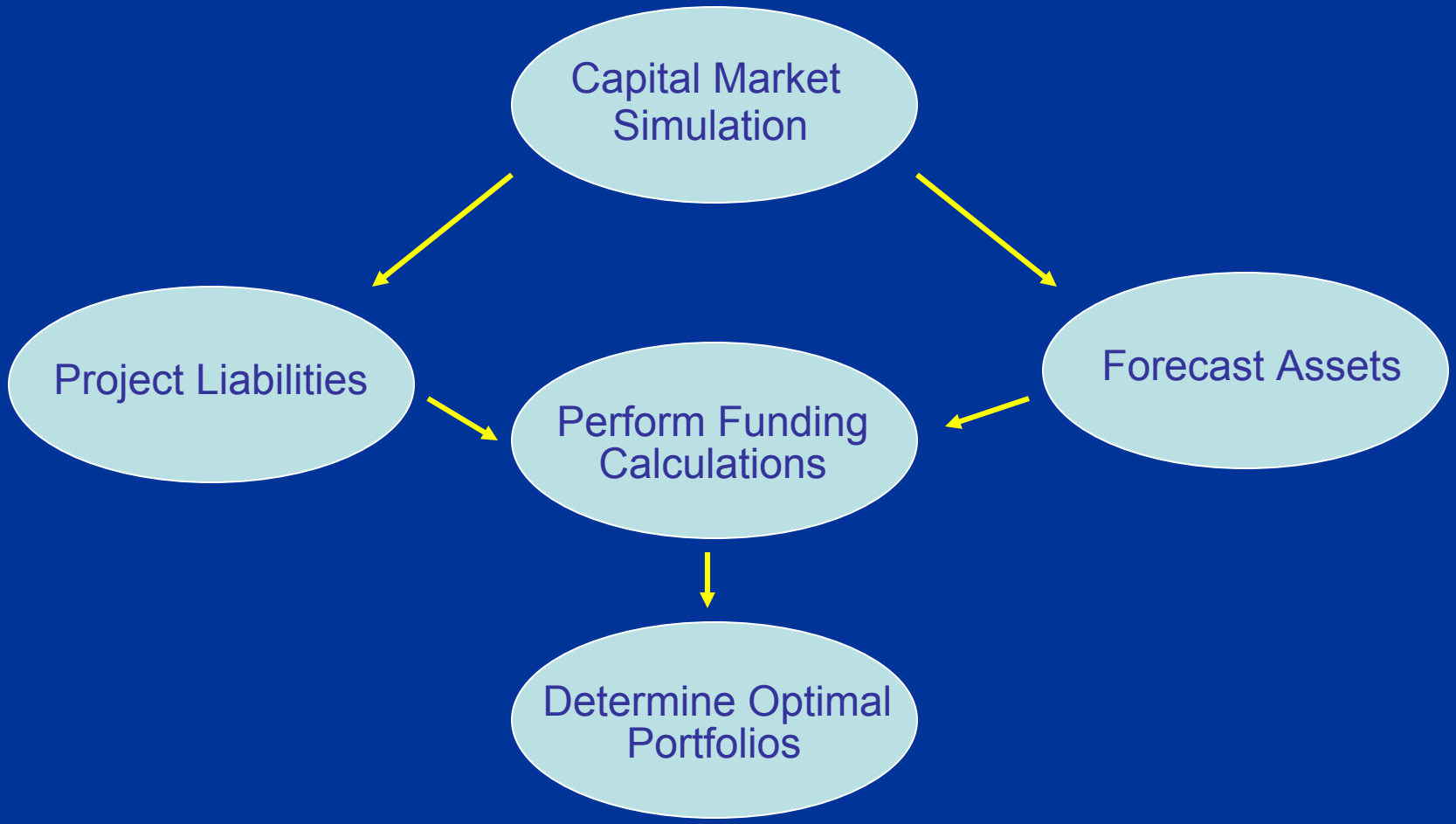
Steps in an A/L Study



Perform Funding Calculations

- Combine projected assets and liabilities from each simulated economic scenario
- Calculate required contribution rates
- Calculate surplus/deficit
- Calculate plan funded status

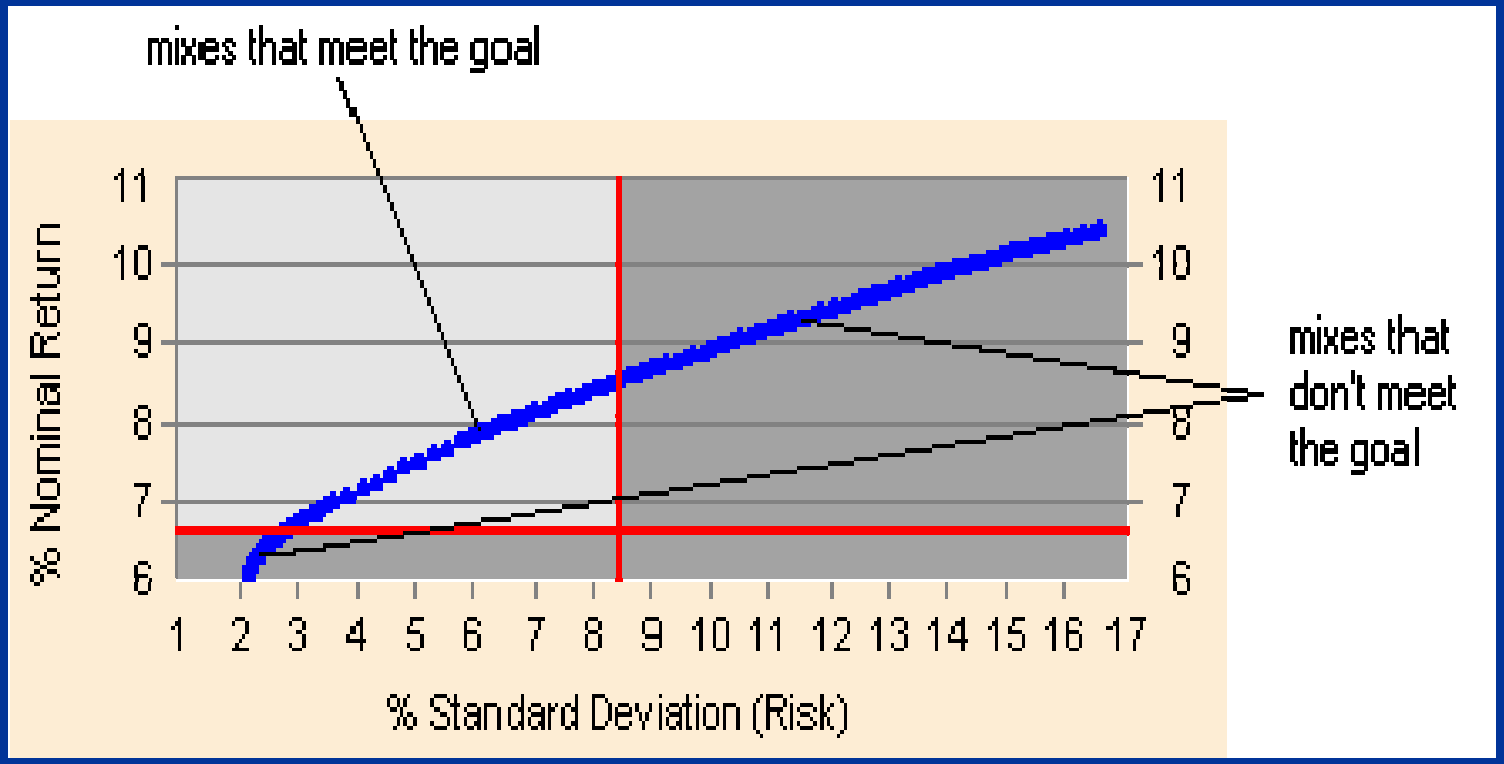
Steps in an A/L Study



Determine Optimal Portfolios

- Set specific funding goals for plans
- Quantify additional non-investment risks
  - Risk of funded ratio dropping below target
  - Risk of contributions going above threshold
- Set risk tolerances
- Eliminate mixes from the original efficient frontier that do not meet goals

Exclude Mixes That Do Not Meet Goals



ProVal ps
Patent Pending

Conclusions

- The investment policy is not coordinated with the funding policy (and vice versa)
- This results in a transfer of risks
- An asset liability study is a helpful “what if” tool when analyzing this risk transfer
- Matching duration of A/L reduces non-investment risk
- Advisable to study results by plan and investigate any strategic opportunities